

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

1. Cancelled.

2. Cancelled.

3. Canceled.

4. (Currently amended): ~~The method as defined in claim 3,~~ A method for producing a modified electroconductive polymer material comprising
an electroconductive polymer; and
a metal oxide filled in a space between chains of said electroconductive polymer,
said metal being oxidized through a galvanic corrosion reaction between three
substances consisting of a metal, a cation radical/dication in the electroconductive
polymer, and absorbed water,
said method comprising the steps of:
allowing an electroconductive polymer and a metal having a work function less than that of
said electroconductive polymer to be brought into contact with one another;
keeping the contact between said metal and said electroconductive polymer, under the
presence of absorbed water, so as to create the state of coexistence and forming a galvanic
battery between three substances consisting of said metal, a cation radical/dication in the
electroconductive polymer and said absorbed water; and
entering a formed metal oxide/hydroxide into the electroconductive polymer, and

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diffusingly moving therein to reside in nano-space between chains of said electroconductive polymer.

wherein said step of allowing said electroconductive polymer said metal to be brought into contact with one another includes:

forming on a substrate a film made of an electroconductive polymer;

vapor-depositing on a surface of said film a metal having a work function less than that of said electroconductive polymer; and

penetrating the absorbed water into the electroconductive polymer through the microvoid, micro-scratch or pinhole.

Claim 5. Cancelled.

Claim 6. Cancelled.

Claim 7. Cancelled.

Claim 8. Cancelled.

Claim 9. Cancelled.

Claim 10. (Currently amended): ~~The method as defined in claim 3,~~ A method for producing a modified electroconductive polymer material comprising

an electroconductive polymer; and

a metal oxide filled in a space between chains of said electroconductive polymer,

said metal being oxidized through a galvanic corrosion reaction between three substances consisting of a metal, a cation radical/dication in the electroconductive

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polymer, and absorbed water,

said method comprising the steps of:

allowing an electroconductive polymer and a metal having a work function less than that of
said electroconductive polymer to be brought into contact with one another;

keeping the contact between said metal and said electroconductive polymer, under the
presence of absorbed water, so as to create the state of coexistence and forming a galvanic
battery between three substances consisting of said metal, a cation radical/dication in the
electroconductive polymer and said absorbed water;

entering a formed metal oxide/hydroxide into the electroconductive polymer, and
diffusively moving therein to reside in nano-space between chains of said electroconductive
polymer; and

further comprising a reducing reaction induced by adding a negative ion.

Claim 11. (Previously presented): The method as defined in claim 10, wherein said negative ion is at least one selected from the group consisting of ClO_4^- , BF_4^- , PF_6^- and para-toluene sulfonate ion.

Claim 12. (Currently amended): ~~The method as defined in claim 3,~~ A method for
producing a modified electroconductive polymer material comprising

an electroconductive polymer; and

a metal oxide filled in a space between chains of said electroconductive polymer,

said metal being oxidized through a galvanic corrosion reaction between three

substances consisting of a metal, a cation radical/dication in the electroconductive polymer, and absorbed water,

said method comprising the steps of:

allowing an electroconductive polymer and a metal having a work function less than that of said electroconductive polymer to be brought into contact with one another;

keeping the contact between said metal and said electroconductive polymer, under the presence of absorbed water, so as to create the state of coexistence and forming a galvanic battery between three substances consisting of said metal, a cation radical/dication in the electroconductive polymer and said absorbed water; and

entering a formed metal oxide/hydroxide into the electroconductive polymer, and diffusingly moving therein to reside in nano-space between chains of said electroconductive polymer;

wherein said metal is contacted with said electroconductive polymer in an inhomogeneous pattern.

Claim 13. (Currently amended): ~~The method as defined in claim 3;~~ A method for producing a modified electroconductive polymer material comprising

an electroconductive polymer; and

a metal oxide filled in a space between chains of said electroconductive polymer,

said metal being oxidized through a galvanic corrosion reaction between three substances consisting of a metal, a cation radical/dication in the electroconductive

polymer, and absorbed water,

said method comprising the steps of:

allowing an electroconductive polymer and a metal having a work function less than that of
said electroconductive polymer to be brought into contact with one another;

keeping the contact between said metal and said electroconductive polymer, under the
presence of absorbed water, so as to create the state of coexistence and forming a galvanic
battery between three substances consisting of said metal, a cation radical/dication in the
electroconductive polymer and said absorbed water; and

entering a formed metal oxide/hydroxide into the electroconductive polymer, and
diffusively moving therein to reside in nano-space between chains of said electroconductive
polymer;

wherein said metal contacted with said electroconductive polymer has a structural defect.

Claim 14. (Previously presented): The method as defined in claim 13, wherein said structural defect is at least one selected from the group consisting of a micro-void, micro-scratch and a pinhole.

Claim 15. (Currently amended): ~~The method as defined in claim 3,~~ A method for
producing a modified electroconductive polymer material comprising

an electroconductive polymer; and

a metal oxide filled in a space between chains of said electroconductive polymer,

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said metal being oxidized through a galvanic corrosion reaction between three substances consisting of a metal, a cation radical/dication in the electroconductive polymer, and absorbed water,

said method comprising the steps of:

allowing an electroconductive polymer and a metal having a work function less than that of said electroconductive polymer to be brought into contact with one another;

keeping the contact between said metal and said electroconductive polymer, under the presence of absorbed water, so as to create the state of coexistence and forming a galvanic battery between three substances consisting of said metal, a cation radical/dication in the electroconductive polymer and said absorbed water; and

entering a formed metal oxide/hydroxide into the electroconductive polymer, and diffusingly moving therein to reside in nano-space between chains of said electroconductive polymer;

wherein said metal is brought into contact with said electroconductive polymer by a deposition process selected from the group consisting of vapor deposition, a sputtering process, a plating process, an electrodeposition process and an electron beam process.